From: Smart Cable Guard
Date: 2021-07-05
Subject: SCG v2.3.1 firmware release notes

RELEASE NOTES

v2.3.1.20210618152727 (2021-06-18)

Notice: this update takes up to 30 minutes to be fully installed on SCG 2.0 CU 4G devices due to the LTE-M Modem firmware update. Do not turn off or restart the system in this period.

New/changed features

- None: Firmware is the same as v2.3.0.20210603170510, only 4G LTE-M Modem firmware update patch is changed.

Fixed issues

- **4G LTE-M modem firmware update**
  - SCG-1084: Some units froze during modem update. This problem is fixed.

Known Issues

- When downgrading from 2.3.0 to 2.2.0, a special downgrade package is needed and supplied together with the update package.
- Downgrade to 2.1.2 and older versions is not supported.

v2.3.0.20210603170510 (2021-06-07)

Notice: this update takes up to 30 minutes to be fully installed on SCG 2.0 CU 4G devices due to the LTE-M Modem firmware update. Do not turn off or restart the system in this period.

New/changed features

- **Retrieve modem and connection quality information**
  - SCG-715: Unique ids of modem (IMEI), sim card (ICCID) and connection quality parameters from CUs are now available on the backend.
  - SCG-1077: In the 4G LTE-M Modem, the connection quality parameters are only stored when the modem connection is being established. Now it is possible to reset the modem connection from the backend.
  - In the network tab on the service mechanic interface, there now is an extra information field on when the current PPP session was successfully started.
- **Improved PD measurement**

- SCG-944: In installations with more than 1 sensor per control unit, the PD detection threshold is now independent for each sensor. This improves PD measurements in situations with different noise levels for multiple sensors on the same control unit.
- SCG-1055: Lowered (=improved) minimal acceptable PD detection threshold. This improves PD detection sensitivity for circuits with low noise levels.
- SCG-1056: More (PD) pulses will be recorded and available for analysis. This improves PD detection sensitivity, depending on local noise conditions.

Fixed issues

- **Improved cellular connection and modem operation**
  - SCG-1060 / SCG-1068: Fixed small issue in the AT Command sequence to build and terminate a modem connection. This process now follows the sequence recommended by the modem manufacturer.
  - SCG-1071: Control unit has a new reconnect timer function that keeps track of the amount of disconnects from the server that took place. It will restart the network connection if the connection to the server drops often in a short period of time. Restarting the network connection refreshes the connection with the provider, resolving certain connection stability issues.
- **All 9 fault features are correctly retrieved**
  - SCG-1052: Bug fixed on fault features retrieval (SCG-702) to correctly retrieve two additional fault features.
- **Server address fallback mechanism is disabled for the Service Mechanic Interface**
  - SCG-1061: Server address fallback feature is disabled when using the Service Mechanic Interface, as the configuration is validated by the installer on the field. This feature was hampering the pre-configuration process of control unit for certain use cases.
- **4G LTE-M modem firmware update**
  - SCG-1073: An update patch to update the u-blox SARA-R410M-02B modem module (part of the SCG 2.0 CU 4G (LTE-M)), from v5.08 to v5.11 is added to this release. When another modem type is installed, this patch will not be executed. This update aims to improve quality and reliability of the connection.
  - Fixed issues in the modem firmware release v5.11 (from u-blox):
    - [u-blox ID 105]: In the +COPS AT command the <oper> operator indicator parameter issues a numerical value (MCC-MNC) instead of an alpha numerical string
    - [u-blox ID 275]: APN setting for AT&T: change from "phone" to blank
    - [u-blox ID 436]: The PSM is disabled in the default profile per AT&T's request. The host device can enable it via AT command. This is just a profile change and has no impact on protocol side
    - [u-blox ID 705]: The change of the format of the endpoint in Verizon MNO is preventing u-blox LwM2M server registration to be completed successfully
    - [u-blox ID 4092]: LCP/IPCP renegotiation delay caused PPP negotiation to be unreliable due to timers
    - [u-blox ID 4682]: DTLS null pointer collision
    - [u-blox ID 4741]: Modem crash during data transfer over PPP

- [u-blox ID 5226]: Device crashing on live AT&T network in idle mode when SIB decode is triggered by ML1 before finishing the Page decodes.

Important notes

- This update takes up to 30 minutes to be fully installed on SCG 2.0 CU 4G (LTE-M) systems due to the LTE-M modem firmware update. Do not turn off or restart the system in this period.
- PD detection in units with more than one sensor may yield different (better) results, because sensitivity parameters are no longer shared.

Known Issues

- When downgrading from 2.3.0 to 2.2.0, a special downgrade package is needed and supplied together with the update package.
- Downgrade to 2.1.2 and older versions is not supported.
- Downgrade of SARA-R410M modem firmware to v5.08 is not available over-the-air. From June 2021, all SARA-R410M modules will be supplied by the manufacturer with v5.12.

v2.2.0.20200701144150 (2020-07-03)

New/changed features

- **Improved fault detection using real-time waveform analysis**
  - SCG-702: Improved fault detection using waveform analysis. For each detected fault 9 extra characteristics (fault features) are determined and send to the server. Previously only 3 characteristics were recorded. These additional fault features will in the future increase the reliability of SCG's fault detection and location feature, e.g. by better rejection of unwanted noise signals.
    Note: this firmware implementation is the first phase. Before the improved fault detection becomes available it will undergo extensive field trials and requires a server-side implementation of new functionality. General availability of the improved fault detection is planned for the end of 2020.
  - SCG-732: Store up to 25 raw fault waveforms per minute. Previously, 3 raw fault waveforms per minute were stored. The increased number of waveforms allows better analysis and troubleshooting for detected faults.
- **Firmware version is shown in the top right corner of the Service Mechanic Interface**
  - SCG-938: Previously the top-right corner of the Service Mechanic Interface showed the application version, which is only one part of the full firmware distribution. Now the version of the full firmware distribution, which is much more familiar to users, is shown.
- **Service Mechanic Interface connection status now shows "server" instead of "CFE", and has an extra connection status**

- Previously the connection status field in the Network tab of the Service Mechanic Interface used the word “CFE” to refer to the “server”. The word “CFE”, which is unfamiliar to most users, is replaced by the more generic term “server”.
- The connection status “Disconnecting from server” has been added. Previously, the interface did show a proper status while it was disconnecting from the server/provider when the user changed the configuration. Now, it shows an appropriate status message.

Fixed issues

- **Same sensor ID is shown on multiple sensor ports when changing a sensor from one port to another**
  - SCG-855: Previously, when a sensor is moved from one port to another port on the control unit, then the sensor ID would still show up on the old port. This would e.g. become visible in the asset manager on the server. The duplicate sensor would disappear after a restart of the control unit. This problem is fixed, the sensor ID will no longer be duplicated.
- **Configuration checking mechanism in the “Network” tab of the Service Mechanic Interface is improved**
  - SCG-937: Previously, when making a change to the network configuration and the control unit could not reconnected to the server within 10 minutes, or if the control unit was restarted within 10 minutes, then the control unit would revert to the old settings. This sometimes led to unwanted fallback of the settings if the control was powered down or restarted quickly after a change. This mechanism has changed. Any changes are accepted immediately when a successful server connection is made (not after 10 minutes). And changes to provider settings made locally do never fall back.
- **Changed the reconnection behaviour when both Cellular and LAN are connected at the same time**
  - SCG-951: When the control unit was connected to 3G / 4G and switched to a LAN connection, the control unit could run into an issue with the DNS and default gateway settings. In return, the control unit could not connect via LAN. This has been fixed.
- **Old pulse / fault data is now correctly removed after 31 days**
  - SCG-965: Old pulse and fault data was not removed correctly, which led to longer boot times for control units with lots of historic data. Old data is now correctly removed after 31 days.
- **Emergency restart timer is now shortened from 24 hours to 4 hours**
  - SCG-975: In some very rare cases, it is possible that if a control unit loses its connection to the server/provider, that the normal server reconnection mechanism fails. For such cases, the control unit has an emergency restart timer that will fully restart the control unit if it doesn’t have a connection to the server. This restart timer has been shortened from 24 hours to 4 hours.
- **More system logs can be stored**
  - SCG-976: The CU can now store more system logs. Previously, system logs were limited to approximately 3 days. This could hamper troubleshooting. Now, the time has been extended to a much longer period.
  - SCG-977: The system logs are now also compressed, this way more logs can be stored.

- **Adaptive PD detection threshold improved for circuits with many disturbances/noise**
    - SCG-991: Previously, for circuits with lots of noise the adaptive PD detection threshold mechanism did not work properly, which lead to a sub-optimal PD detection performance. This difference was not very significant, but it was present. This has now been fixed.

Known issues

- **Upgrading from control unit firmware version 2.0.2 to 2.2.0.**
    - In some cases, an issue can occur when upgrading from 2.0.2 to 2.2.0 using the Service Mechanic Interface. Due to this issue, the control unit will not run the update.

Workaround: Restart the control unit and try the update again.

Note: this issue is in firmware 2.0.2, it is not in the new firmware 2.2.0.

Important notes

- **Downgrading from firmware version 2.2.0 to version 2.1.2 / 2.0.2**
    - During the upgrade of the firmware from 2.1.2 / 2.0.2 to 2.2.0 the bootloader is also updated to the latest version. So, if you decide to downgrade from 2.2.0 to 2.1.2 / 2.0.2, the bootloader should also be downgraded. For this purpose, we have 2 downgrade files that should be used when downgrading the firmware from 2.2.0:

      For a downgrade to 2.1.2 the following file should be used: **scg20-cu-update_os_su_app_ejre-2.1.2.20200325161221.tgz.gpg**

      For a downgrade to 2.0.2 the following file should be used: **scg20-cu-update_os_su_app_ejre-2.0.2.20200325151806.tgz.gpg**

v2.1.2.20191016135419 (2019-10-16)

New/changed features

- None.

Fixed issues

- **CU LAN port**
    - SCG-962: 1 Gbps link not working consistently. Some laptops have a small chance that they don't establish a proper ethernet link when connected to the LAN port.

Known issues

- **Service Mechanic Interface**

- SCG-938: The top-right corner of the service mechanic interface shows the internal application version instead of the firmware version (such as 2.1.2).
  Severity: low –no functional impact.

v2.1.1.20191007135336 (2019-10-07)

New/changed features

- None.

Fixed issues

- **LTE-M (4G) connection**
  - SCG-961 - Disable power saving mode 4G modem. Under certain circumstances this mode caused undesired disconnects of the CU-CFE connection.

v2.1.0.20190920170511 (2019-09-20)

New/changed features

- **Support for new SCG 2.0 CU 4G with LTE-M (4G) modem**
  - SCG-862 – 4G modem support and connect script improvements made.
- **Improved power supply lost detection**
  - SCG-909 - Improved power supply lost detection. If a voltage dip happens in the network it could be detected a PowerSupplyLost by the CU, which could cause an undesired side-effect for the fault detection feature.

Fixed issues

- **Service mechanic interface improvements**
  - SCG-932 – Added some small language improvements in the Service Mechanic Interface.

v2.0.2.20190903130822 (2019-09-03)

New/changed features

- None.

Fixed issues

- **Service Mechanic Interface:** Due to an issue with the 3G/4G connection script, the modem and provider related information was not visible in the Service Mechanic Interface.

v2.0.1.20190726131406 (2019-08-27)

New/changed features

- None.

Fixed issues

- **Connection to the SCG server:** Due to an issue with the 3G/4G connection script, the CU took to long to reconnect after the mobile network operator closed the connection.

  1. SIT-370 - Control Unit connection is unstable after update to firmware 2.0.

v2.0.20190605145515 (2019-06-14)

New/changed features

- The Linux kernel is updated from 3.10.17 to 4.9.88.
- Chinese translation for the service mechanic interface.

Fixed issues

- **Deletion of raw data:** A couple of issues regarding the automatic deletion of raw pulse and fault data are fixed:

  1. SCG-708 - Raw fault measurements are not automatically deleted after 1 month. Due to this issue the buffer for raw fault waveform could be full and the waveforms unavailable for investigation afterwards.
  2. SCG-624 – “Delete all” functionality is not working in RtMon.
  3. SCG-889 - Raw PD measurements disappear after a while. Due to this issue the raw PD waveforms were unavailable for investigated afterwards.

- **Kernel panic issue:** Due to an issue with the voltage regulator, the CPU of the CU cannot get enough peak voltage, which results in a crash of the application. This is the case linked to this issue:

  1. SIT-235 - Kernel panics - oscillator voltage level too low - NULL characters in application log.

v1.4.4485 (2019-01-18)

New/changed features

- None.

Fixed issues

- None.

v1.3.4413 (2018-10-08)

New/changed features

- The CU application now always runs for at least 60 minutes, even in case of unexpected errors. This allows for retrieval of log files and upload of software updates.
    1. SCG-780 - Remote firmware update should always be possible
- SU status LED blinks orange/green during SU firmware update:
    1. SCG-662 - The status LED on the CU is off when the firmware of the SU is being updated.

Fixed issues

The following fixes and improvements were made for v1.3.4413.

- **SU-CU connection:** Reworked part of the SU-CU connection design and improved the implementation so that the connection restores itself in all possible error scenarios. Also, various software errors were fixed that could potentially cause the connection to fail. This change fixes the following issues:
    1. SCG-767 - After SU disconnect, CU does not reconnect with SU
    2. SCG-772 - InterruptedException in OsControl
- **3G modem error:** improved 3G modem error handling so that the 3G connection reliability is improved. This change fixes the following issues:
    1. SCG-776 - USB 3G modem disappears
    2. SCG-775 - 3G modem/sim does not react
    3. SCG-777 - pppd: device locked by pid
    4. SCG-757 – SIM PIN status problem
- **Fault detection:** Under certain, rare circumstances a fault could be missed by the system due to interference with the sync by noise on the cable network in the second before the actual fault. Faults are now detected up until 2 seconds after synchronization between master and slave sensor was lost. This fixes the following issues:
    1. SCG-781 – Missed fault after SU gets out of sync
- **Data storage:** In case of corruption in data storage files on the CU, the CU now deletes the corrupt files and keeps working normally.
    1. SCG-788 - Data corruption on CU causes thread starvation on CFE
    2. SCG-735 – Data parse error causes reboot loop.